

WHAT IS CLAIMED IS:

1. An optical multi-beam scanning device, comprising:
  - 5 a plurality of light sources;
  - deflecting means for deflecting light beams from the light sources;
  - post-deflection optical means for making the light beams deflected by the deflecting means enter a surface to be scanned in a vertical scanning direction with respect to a normal direction of the surface to be scanned at a predetermined angle;
  - 10 horizontal synchronization detecting means for synchronizing the light beams in a horizontal scanning direction; and
  - 15 optical path folding means for folding the light beams, directing towards the surface to be scanned, to the horizontal synchronization detecting means, wherein when the light beams are assumed to reach the surface to be scanned with the light beams not being folded by the optical path folding means, a light receiving surface of the horizontal synchronization detecting means is tilted so as to output a horizontal synchronized signal when the light beams come to the same position on the surface to be scanned in the horizontal scanning direction.
- 20 2. The optical multi-beam scanning device according to claim 1, wherein the light receiving surface of the

horizontal synchronization detecting means is tilted in the vertical scanning direction at an angle equivalent to that of the surface to be scanned.

5       3. The optical multi-beam scanning device according to claim 1, wherein when a tilting direction of the light receiving surface of the horizontal synchronization detecting means is assumed to be in a plane formed in the vertical scanning direction and the horizontal scanning direction, and the light  
10      beams are assumed to reach the surface to be scanned with the light beams not being folded by the optical path folding means, the tilting angle is a direction such that the horizontal synchronized signal is output when the light beams are on the same position on the surface to be scanned in the horizontal  
15      scanning direction.

4. The optical multi-beam scanning device according to claim 1, wherein a tilting angle of the light receiving surface of the horizontal synchronization detecting means includes the horizontal scanning direction, the vertical scanning direction, and a direction perpendicular to the horizontal scanning direction and the vertical scanning direction.

25       5. The optical multi-beam scanning device according to claim 1, wherein  
            a relationship among wavelengths of the light beams from the light sources is set so that their moving amounts

in the horizontal scanning direction with respect to a deflecting angle are uniform,

an optical element for changing an emitting angle according to a fluctuation in the wavelengths of the light 5 beams emitted from the light sources is arranged on an optical path between the deflecting means and the horizontal synchronization detecting means.

6. An optical multi-beam scanning device,  
10 comprising:

a plurality of light sources;  
deflecting means for deflecting light beams from the light sources;  
post-deflection optical means for making the light beams 15 deflected by the deflecting means enter a surface to be scanned in a vertical scanning direction with respect to a normal direction of the surface to be scanned at a predetermined angle;

horizontal synchronization detecting means for 20 synchronizing the light beams in a horizontal scanning direction;

optical path folding means for folding the light beams, directing towards the surface to be scanned, to the horizontal synchronization detecting means; and

25 a light shielding member having a tilt such that when the light beams are assumed to reach the surface to be scanned with the light beams not being folded by the optical path folding means, the light beams are emitted to a light receiving

surface of the horizontal synchronization detecting means with a uniform rate when the light beams come to the same position on the surface to be scanned.

5        7. The optical multi-beam scanning device according to claim 6, wherein the light shielding member is provided so that when the light beams come to the same position on the surface to be scanned in the horizontal scanning direction, the light beams come to a boundary between a light shielding portion and a non-light shielding portion.

10        8. The optical multi-beam scanning device according to claim 6, wherein the light shielding member is integral with a housing for holding the post-deflection optical means.

15        9. The optical multi-beam scanning device according to claim 6, wherein

20        a relationship among the wavelengths of the light beams from the light sources is set so that moving amounts in the horizontal scanning direction with respect to a deflecting angle are uniform, and

25        an optical element for changing an emitting angle according to a fluctuation in wavelengths of the light beams emitted from the light sources is arranged on an optical path between the deflecting means and the horizontal synchronization detecting means.

10. An optical multi-beam scanning device,

comprising:

- a plurality of light sources;
- deflecting means for deflecting light beams from the light sources;
- 5 post-deflection optical means for making the light beams deflected by the deflecting means enter a surface to be scanned in a vertical scanning direction with respect to a normal direction of the surface to be scanned at a predetermined angle;
- 10 horizontal synchronization detecting means for synchronizing the light beams in a horizontal scanning direction; and
  - optical path folding means for folding the light beams, directing towards the surface to be scanned, to the horizontal synchronization detecting means;
  - 15 wherein an optical element for changing an emitting angle according to a fluctuation in the wavelengths of the light beams emitted from the light sources is arranged on an optical path between the deflecting means and the horizontal synchronization detecting means.
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- 11. The optical multi-beam scanning device according to claim 10, wherein the optical element for changing the emitting angle according to the fluctuation in the wavelengths of the light beams has a wavelength characteristic such that positions of the light beams on the horizontal synchronization detecting means do not change even when the wavelengths change.

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12. An optical multi-beam scanning device, comprising:

a plurality of light sources;

5 deflecting means for deflecting light beams from the light sources;

10 post-deflection optical means for making the light beams deflected by the deflecting means enter a surface to be scanned in a vertical scanning direction with respect to a normal direction of the surface to be scanned at a predetermined angle;

horizontal synchronization detecting means for synchronizing the light beams in a horizontal scanning direction; and

15 optical path folding means for folding the light beams, directing towards the surface to be scanned, to the horizontal synchronization detecting means;

wherein the optical path folding means changes an emitting angle according to a fluctuation in wavelengths of the light beams emitted from the light sources.

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13. The optical multi-beam scanning device according to claim 12, wherein the optical path folding means has a wavelength characteristic such that positions of the light beams on the horizontal synchronization detecting means do 25 not change even when the wavelengths change.

14. An image forming apparatus, comprising:

the optical multi-beam scanning device according to

claim 1; and

a photoreceptor having a surface to be scanned on which latent images are formed based on light beams from the optical multi-beam scanning device.

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15. An image forming apparatus, comprising:  
the optical multi-beam scanning device according to  
claim 6; and

10 a photoreceptor having a surface to be scanned on which latent images are formed based on light beams from the optical multi-beam scanning device.

15 16. An image forming apparatus, comprising:  
the optical multi-beam scanning device according to  
claim 10; and  
a photoreceptor having a surface to be scanned on which latent images are formed based on light beams from the optical multi-beam scanning device.

20 17. An image forming apparatus, comprising:  
the optical multi-beam scanning device according to  
claim 12; and  
a photoreceptor having a surface to be scanned on which latent images are formed based on light beams from the optical  
25 multi-beam scanning device.